

Potentiometric Surface Map of the Bedrock Aquifers of Warren County, Indiana

by
Glenn E. Grove
Division of Water, Resource Assessment Section
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Warren County is located in the north-central portion of Indiana, adjacent to the state of Illinois to the west, and is bounded by the counties of Benton, Tippecanoe, Fountain, and Vermillion. The entire county lies within the Middle Wabash River Basin.

The Potentiometric Surface Map (PSM) of the bedrock aquifers of Warren County was mapped by contouring the elevations of 441 static water-levels reported on well records received primarily over a 50 year period. These wells are completed in aquifers at various depths, and typically, under confined conditions (bounded by impermeable layers above and below the water bearing formation). However, some wells were completed under unconfined (not bounded by impermeable layers) settings.

The potentiometric surface is a measure of the pressure on water in a water bearing formation. Water in an unconfined aquifer is at atmospheric pressure and will not rise in a well above the top of the aquifer, in contrast to groundwater in a confined aquifer which is under hydrostatic pressure and will rise in a well above the top of the water bearing formation.

Static water-level measurements in individual wells used to construct county PSMs are indicative of the water-level at the time of well completion. The groundwater level within an aquifer constantly fluctuates in response to rainfall, evapotranspiration, groundwater movement and pumpage. Therefore, measured static water-levels in an area may differ due to local or seasonal variations. Because fluctuations in groundwater are typically small, static water-levels can be used to construct a generalized PSM. As a general rule, but certainly not always, groundwater flow approximates the overlying topography and intersects the land surface at major streams.

Universal Transverse Mercator (UTM) coordinates for the water wells were either physically obtained in the field, determined through address geocoding, or reported on water well records. The location of the majority of the water well records used to make the PSM were field verified.

Elevation data were obtained from a digital elevation model. Quality control/quality assurance procedures were utilized to refine or remove data where errors were readily apparent.

Potentiometric surface elevations range from a high of 700 feet mean sea level (msl) in the central portion of the county, to a low of 490 feet msl along the southeast corner along the Wabash River. Groundwater flow direction within the majority of the county is generally towards the Wabash River and its major tributaries.

Bedrock potentiometric surface elevation contours have not been extended through portions of the county. These areas are lacking in data and/or covered by more prolific unconsolidated deposits that limit the necessity to complete wells in bedrock.

The county PSM can be used to define the regional groundwater flow path and to identify significant areas of groundwater recharge and discharge. County PSMs represent overall regional characteristics and are not intended to be a substitute for site-specific studies.